(19) Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) Publication number: **0 412 669 A1**

(12) EUROPEAN PATENT APPLICATION

(21) Application number: **90307862.4**

(51) Int. Cl.5: **E06B 3/54**

(22) Date of filing: **18.07.90**

(30) Priority: **28.11.89 GB 8926886**
11.08.89 GB 8918395

(43) Date of publication of application:
13.02.91 Bulletin 91/07

(84) Designated Contracting States:
AT BE CH DE DK ES FR GR IT LI LU NL SE

(71) Applicant: **GLAZPART LTD**
Wildmere Road, Daventry Road Industrial Estate
Banbury, Oxon, OX16 7XR(GB)

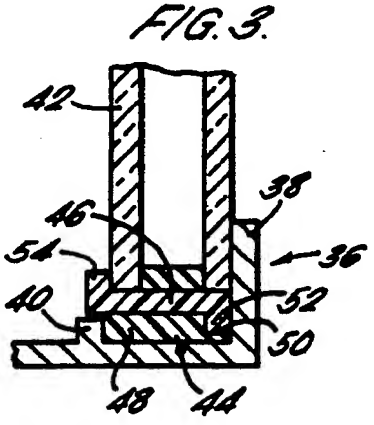
(72) Inventor: **Rhodes, David 2Higher Wardington Cottages**
Upper Wardington
Banbury,Oxon OX17 1SP(GB)
Inventor: **Hanley,Kenneth Alfred Heathcote House**
Marsh Lane,Little Tew
Chipley Norton Oxon, OX7 4JE(GB)
Inventor: **Hall, Kenneth**
28, Ridgley Close
Warwick, CV34 5PD(GB)

(74) Representative: **Allard, Susan Joyce et al**
BOULT, WADE & TENNANT, 27 Furnival Street
London EC4A 1PQ(GB)

(54) A panel assembly.

(57) A panel assembly comprising a panel (42) having a front face and a back face, a frame (36) surrouding the panel, first (48) and second (46) longitudinal wedge-shaped packing elements which are disposed between the frame and the panel and which include engaging means preventing the elements from moving down each other, the first packing element (48) being held against transverse movement with respect to the frame (36), the second packing element (46) having an upstanding portion (54) which faces the front face of the panel and being held against movement in a first direction, which first direction extends from the panel towards the upstanding portion of the second packing element, by engagement of a surface of the first packing element (48) with a surface of the second packing element (46), and the assembly including means preventing movement of the second packing element (46) in a second direction which is opposite to the first direction.

FIG. 3.



EP 0 412 669 A1

FIG. 1.

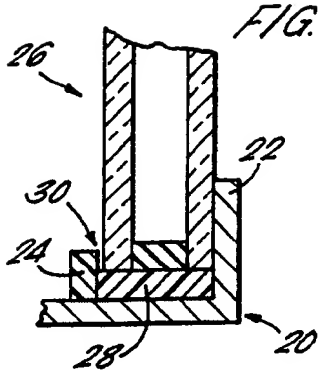


FIG. 2.

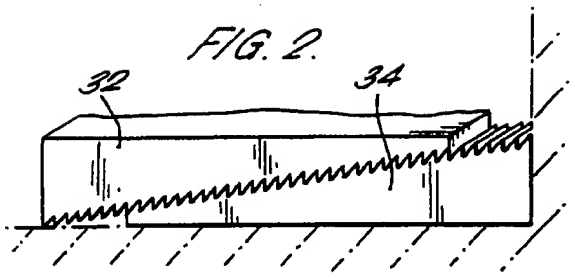


FIG. 3.

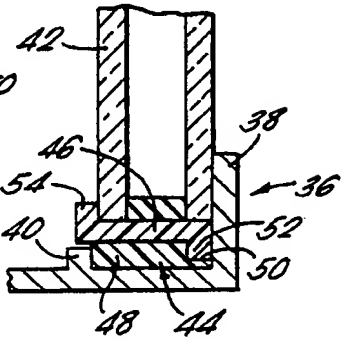


FIG. 4.

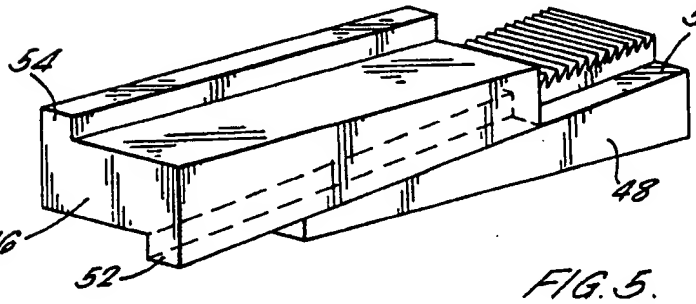


FIG. 5.

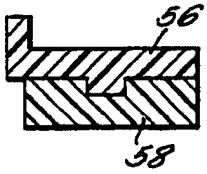


FIG. 6.

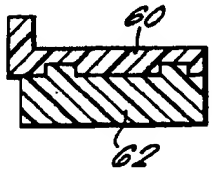


FIG. 7.

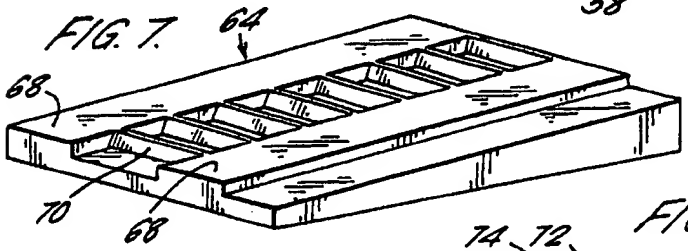


FIG. 8.

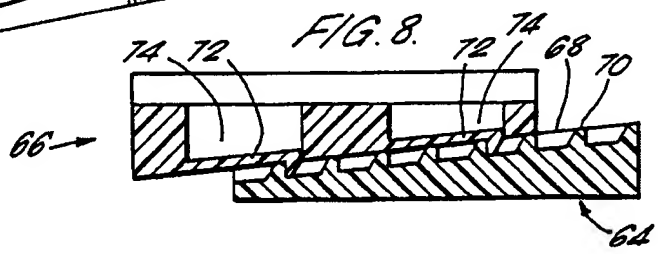


FIG. 9.

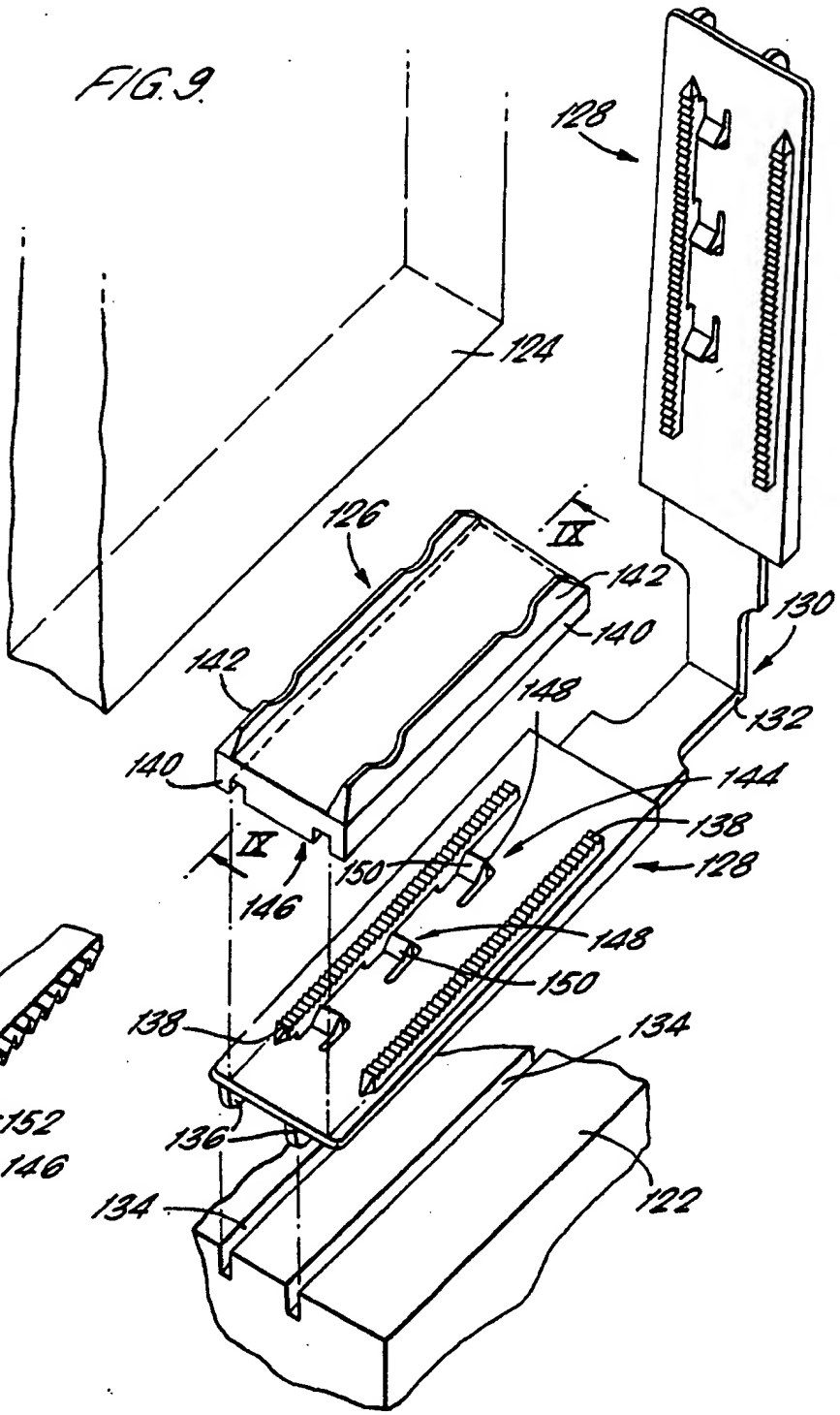

128
124
126
IX
142
140
130
142
148
132
140
144
138
IX
150
128
146
148
150
138
134
136
134
122

FIG. 9A.

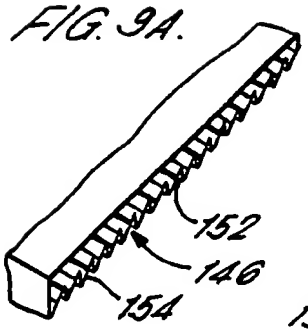

152
146
154

FIG. 10.

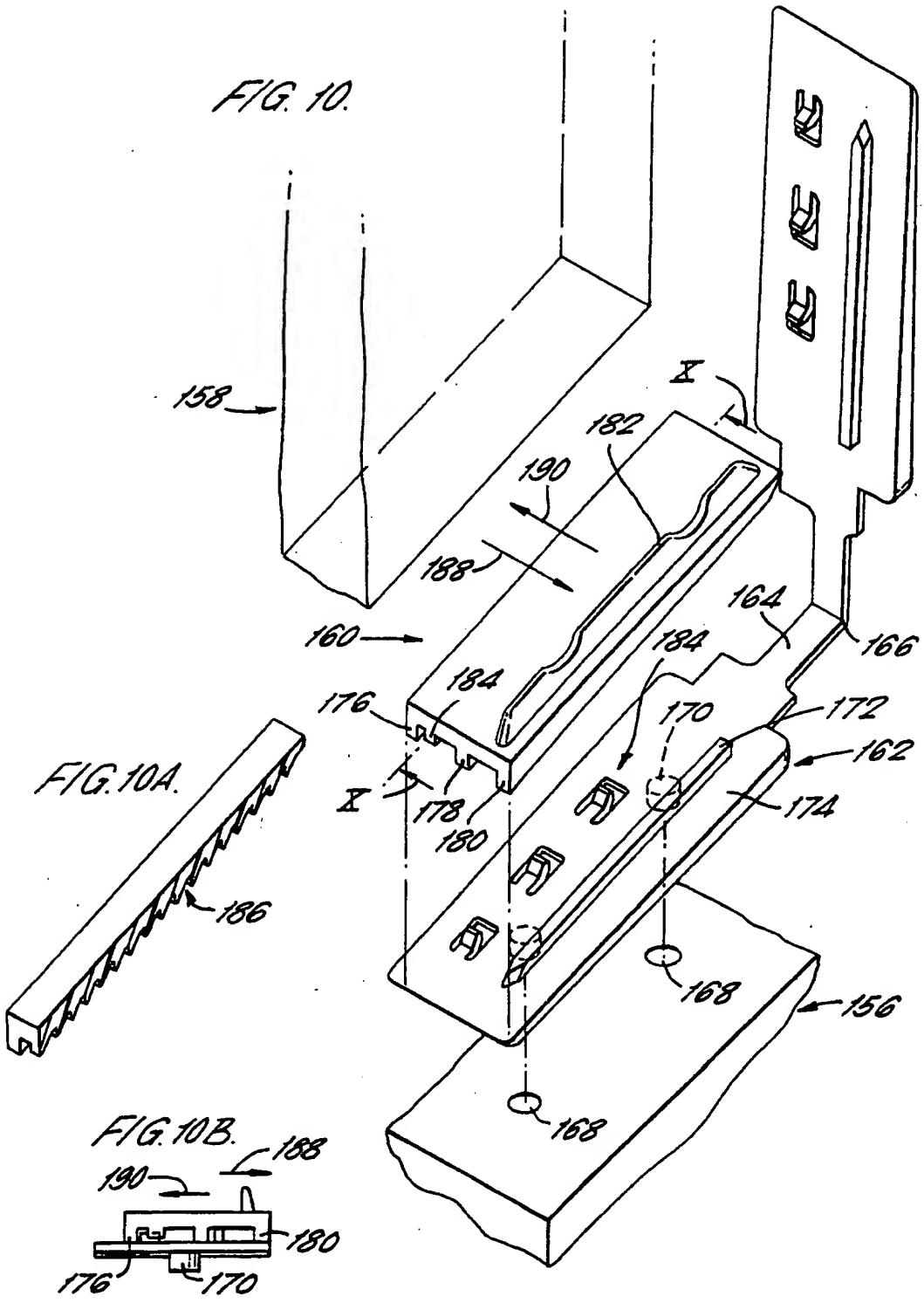


FIG. 10A.

FIG. 10B.

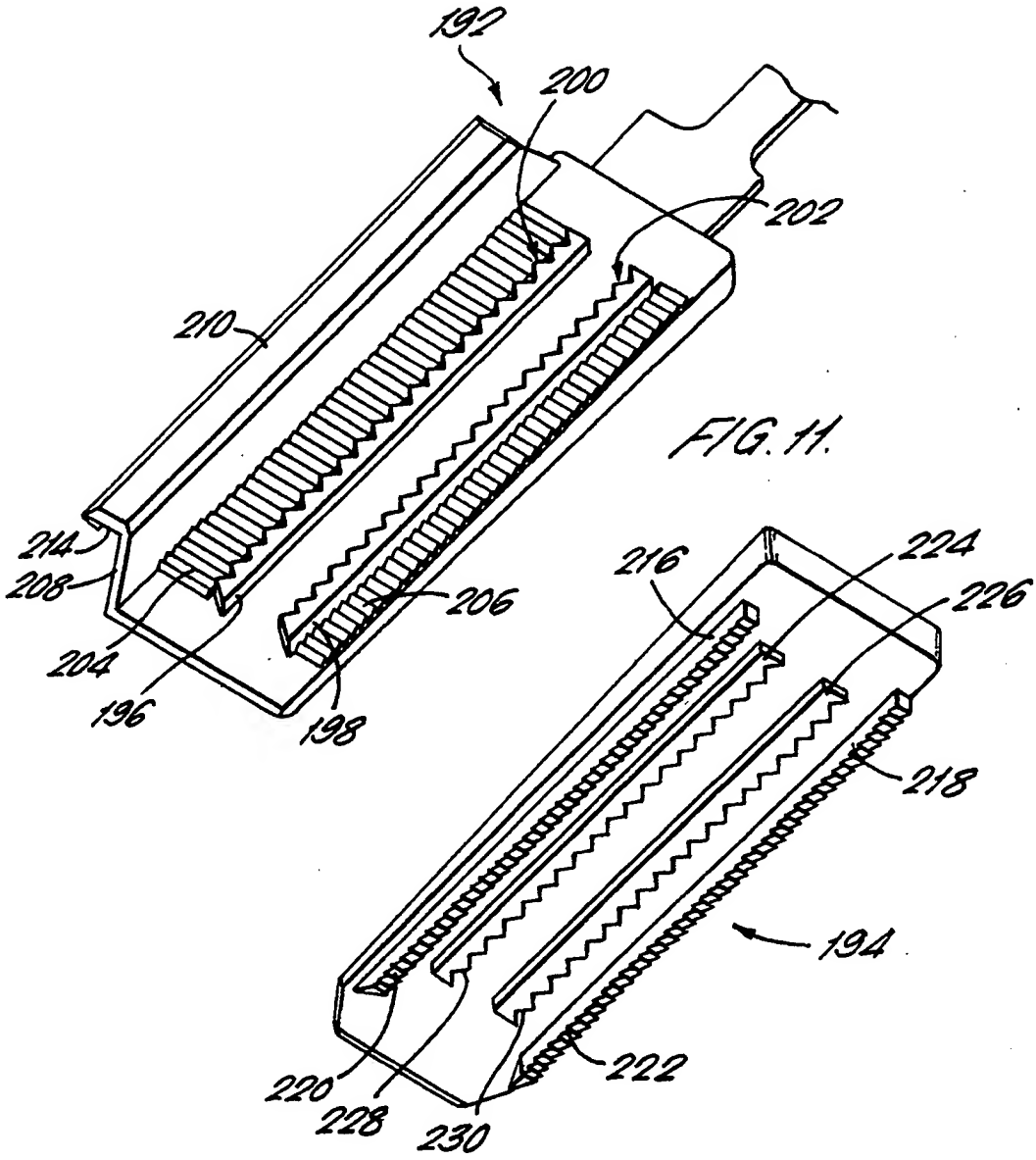


FIG. 11.

FIG. 11A.

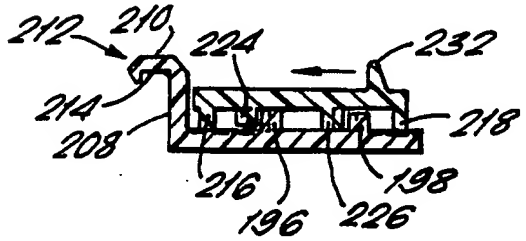
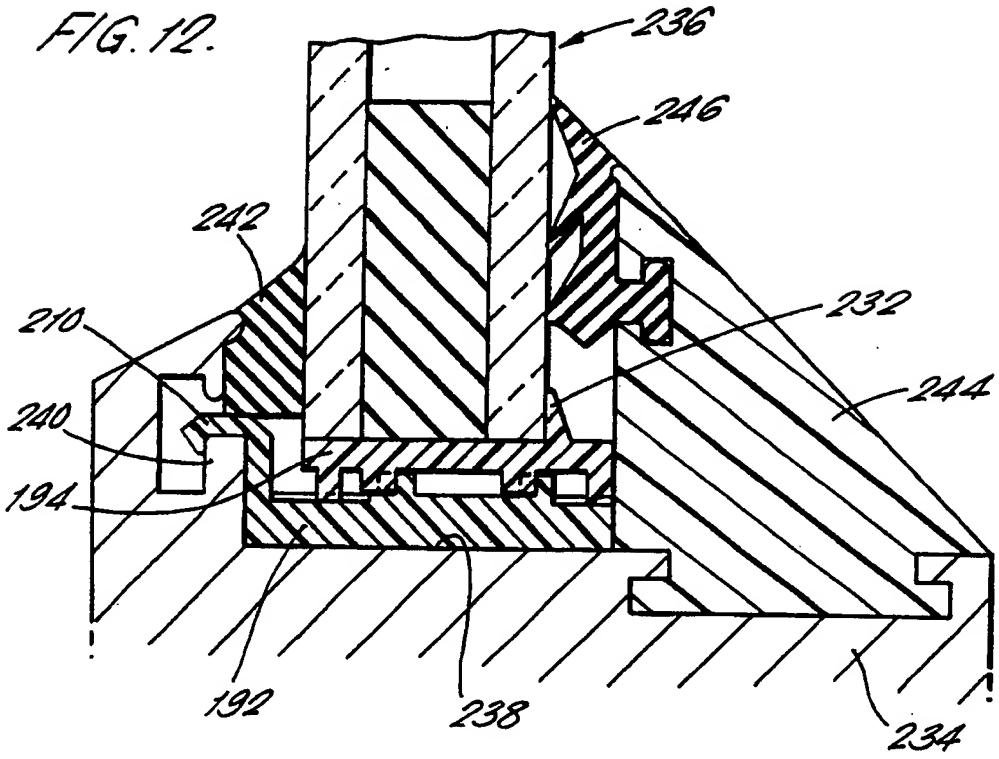


FIG. 12.


236
246
242
232
210
244
240
194
192
238
234

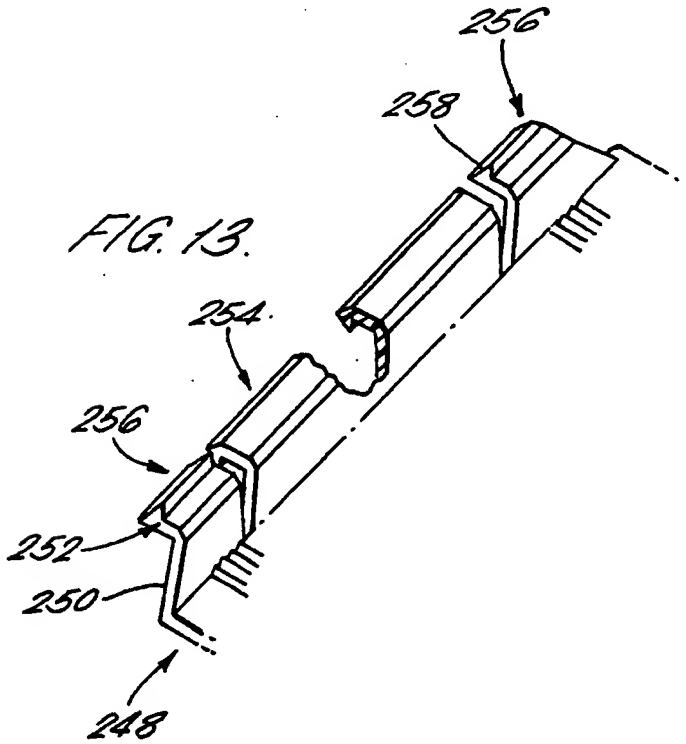

256
258
254
256
252
250
248

FIG. 13.

FIG. 14.

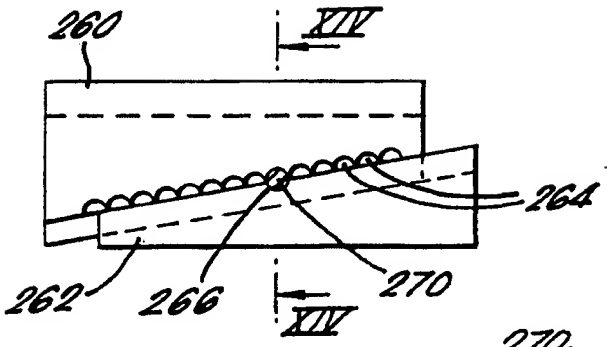


FIG. 14A.

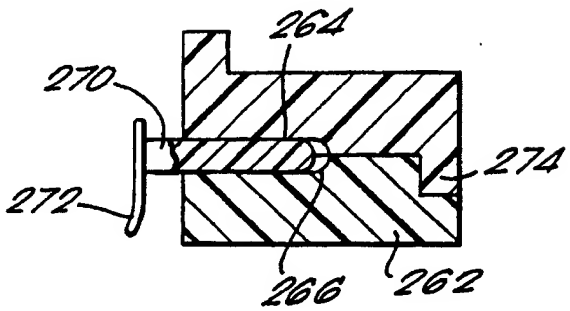


FIG. 15.

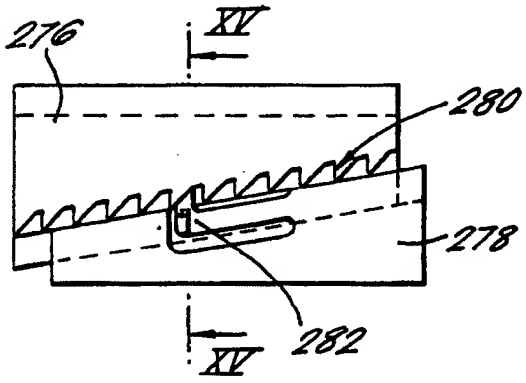


FIG. 15A.

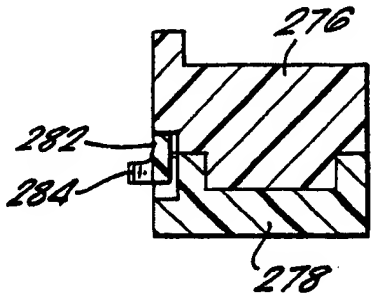


FIG. 16.

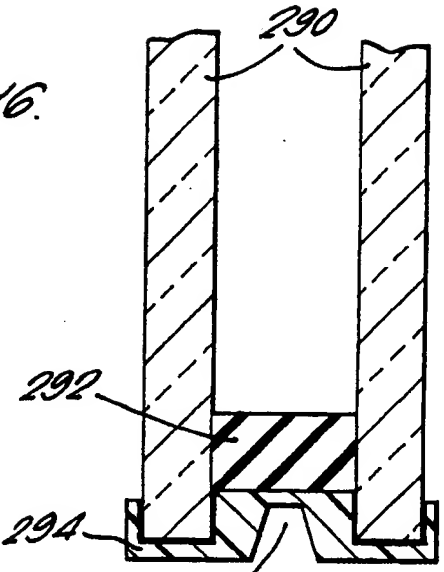
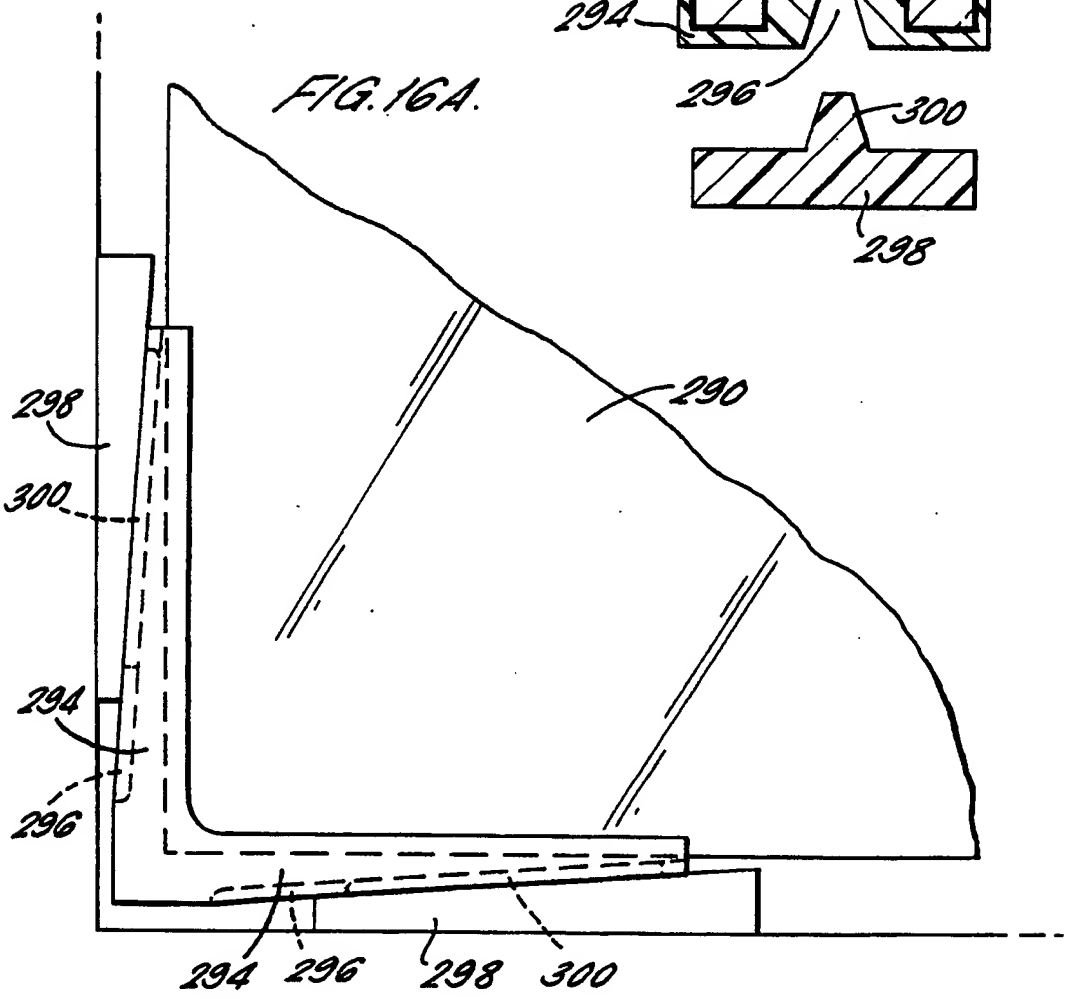


FIG. 16A.



A PANEL ASSEMBLY

This invention relates to a panel assembly comprising a panel having a front face and a back face, a frame surrounding the panel, first and second longitudinal packing elements which are disposed between the frame and the panel and longitudinal sealing means engaging the frame and the panel, the first packing element being held against transverse movement with respect to the frame. The panel may be a single pane of glass or a sealed double - or triple-glazed unit, or a panel of wood, plastic or metal.

In known glazing assemblies, the frame has an upstanding wall on the inside - that is, on the side nearest the interior of a building to which the glazing assembly is to be fitted - and the glass panel will be fitted to the outside of this wall. Outside of the glass panel is an upstanding retaining wall. Since the glass panel has to be lifted over the retaining wall so as to be dropped into the channel between the two walls, there is clearance between the periphery of the glass panel and the frame. To take up this clearance, packing elements are fitted between the frame and the glass panel. In some cases, the packing elements are simply flat elements and in other cases the packing elements are co-operating pairs of wedge-shaped elements. A bead and sealing strip are fitted between the glass panel and the retaining wall.

The disadvantage with this assembly is that a burglar can lift off the bead and sealing strip using a tool such as a scraper and then remove the glass panel without too much difficulty.

The object of the invention is to provide a panel assembly in which removal of the panel is made more difficult and time consuming.

Accordingly, the present invention provides a panel assembly comprising a panel having a front face and a back face, a frame surrounding the panel, first and second longitudinal packing elements which are disposed between the frame and the panel and longitudinal sealing means engaging the frame and the panel, the first and second packing elements being wedge-shaped and including engaging means which prevent the elements from moving down each other, the first packing element being held against transverse movement with respect to the frame, the second packing element having an upstanding portion which faces the front face of the panel and is held against movement in a first direction which first direction extends from the panel towards the upstanding portion of the second packing element, by engagement with a surface of the first packing element with a surface of the second packing element, and means preventing movement of the second packing element in a second direction which is opposite to the first direction.

The packing elements are used in the normal manner to take up clearance between the frame and the panel.

The upstanding portion of the second packing element will be on the outside of a fitted glazing panel assembly and, with all the clearance between the frame and the panel taken up by the packing elements and access to the assembly only being from the outside, the panel cannot be removed from the outside without damaging, or destroying, the assembly.

Conveniently, the surfaces of the first and second packing elements which engage each other are provided by longitudinal walls confronting each other.

The two packing elements are wedge-shaped and include engaging means which prevent the elements from moving down each other. After the components of the assembly are in place, then the elements of each pair of wedge-shaped packing elements are moved with respect to one another so that all of the clearance between the frame and the panel is taken up.

The engaging means can be provided on the inclined opposed surfaces of the packing elements or on opposed surfaces of the elements facing in the first and second directions, and the engaging means may comprise a pawl and rack formation, or teeth.

Preferably, the means preventing movement of the second packing element in the second direction is removable and, typically, comprises a sealing means such as a beading engaging the back face of the panel. Advantageously, when the said means is removed, the second packing element is movable with respect to the first packing element in the second direction by a pre-determined distance to a position at which the engaging means is disengaged.

In practice, the removable means, the beading, would be on the inside ensuring that access could not be gained to the removable means from the outside. If the panel had to be removed or replaced for some reason, then the removable means would be removed, the engaging means would be disengaged and the second packing element of each pair would then be moved downwardly along the first packing element creating enough clearance between the panel and the frame for the panel to be removed and repaired or replaced.

The means preventing movement of the second packing element in the second direction may comprise a surface of the first packing element or

frame which faces in the first direction and a surface of the second packing element which faces in the second packing direction, the two surfaces facing each other. Conveniently, these surfaces are provided by longitudinal walls confronting each other.

The said engagement of the two packing elements may comprise a pawl and rack formation. Preferably, the first packing element is secured to the frame and has one or more pawls extending perpendicular to the plane of the frame. The panel is then offered up so that it sits on the first packing element. The second packing element has an upstanding portion for facing the panel and has the rack or racks. The second element is pushed in a direction perpendicular to the panel so that the or each pawl engages over the projections or teeth of the respective rack.

Preferably one of the packing elements and co-operates with a wedge-shaped third element to take up any remaining clearance.

Preferably, the frame and the first packing element have interengaging formations holding the first packing element against transverse movement with respect to the frame, which formations may comprise: a channel in the frame receiving the first packing element; a longitudinal groove in the frame receiving a longitudinal projection of the first packing element, or a bore in the frame receiving a stud of the first packing element. The first packing element may have a flexible projection which extends in the second direction and which is undercut and engages over an upstanding projection of the frame. Furthermore, the first packing element and the frame may have aligned bores and screws may be used to secure them together.

In the accompanying drawings:

Figure 1 is a diagrammatical section of a part of a known glazing panel assembly;

Figure 2 is a side view of two wedge-shaped packing elements;

Figure 3 is a diagrammatical section of part of another glazing panel assembly;

Figure 4 is a perspective view of the two co-operating wedge-shaped packing elements of the assembly of Figure 3;

Figures 5 and 6 are cross-sections on variations on the two co-operating packing elements of Figures 3 and 4;

Figures 7 and 8 show another two co-operating wedge-shaped packing elements having pawl and rack formations on their inclined opposed surfaces;

Figure 9 is a perspective exploded view of the components of one corner of a further glazing panel assembly, Figure 9 being a scrap view on IX-IX of the second packing element;

Figure 10 is a perspective exploded view of the components of one corner of another glazing panel assembly, Figure 10A being a scrap view on X-X of the second packing element, and Figure 10B being an end view of the two packing elements together.

Figure 11 is a perspective view of a further two co-operating wedge-shaped packing elements, Figure 11A being an end view of the two packing elements;

Figure 12 is a cross-section of part of a glazing panel assembly, including beading, and incorporating the packing elements of Figure 11;

Figure 13 is a scrap perspective view showing a modification to the first packing element shown in Figure 11;

Figure 14 is a side view of a further two co-operating wedge-shaped packing elements, Figure 14A being a cross-sectional view along the line XIV-XIV Figure 14;

Figure 15 is a side view of a further two co-operating wedge-shaped packing elements, Figure 15A being a cross-sectional view along the line XV-XV of Figure 15; and

Figure 16 is a sketch cross-sectional view of an alternative way of locking two wedge-shaped packing elements together, Figure 16A being a perspective side view of the packing elements of Figure 16 applied to a corner of a glazing unit.

Figure 1 shows a known glazing panel assembly comprising a rectangular frame 20 having an upstanding inner wall 22 and an upstanding retaining wall 24. The retaining wall 24 may be an integral part of the frame 20. The two upstanding walls 22 and 24 form a channel for reception of a glass panel 26 which, in this case, is a sealed double-glazed unit. Since, when fitting the glass panel 26, it will have to be lifted over the retaining wall 24, there will be a clearance between the panel and the frame 20. To take up this clearance, packing in the form of flat packing elements 28 are arranged between the frame and the glass panel. In the region 30 between the retaining wall 24 and the glass panel 26, there would be beading and a sealing strip. These have been omitted in the interests of clarity in the drawings. The problem with this known assembly is that, once the beading and sealing strip have been removed, the glass panel 26 can be too easily removed.

Instead of using flat packing elements 28, Figure 2 shows two co-operating wedge-shaped packing elements 32 and 34. The element 34 is positioned, for example, at the bottom right hand corner of a glazing assembly, with the glass panel sitting on the top of the element 32. The element 32 is then moved up the element 34 so taking up the clearance. To prevent the element 32 from moving down the element 34, the inclined faces of the two

elements have transverse projections or ridges with a saw-tooth profile.

However, there is nothing to prevent the packing element 32 from being moved transversely with respect to the element 34 and so allowing removal of the panel.

Figure 3 shows a glazing panel assembly comprising a frame 36 with an upstanding inner wall 38 and an upstanding integral retaining wall 40, a glass panel 42 having a front face on the left of the drawing and a back face on the right and packing 44. The packing comprises two co-operating wedge-shaped packing elements 46 and 48 which are also shown in Figure 4. The lower or first packing element 48 is held in place between the two walls 38 and 40 or may be secured by, for example, being screwed to the frame. The lower element 48 has a recess 50 in its inclined surface and the upper or second element 46 has a projection 52 received in the recess. The upper element 46 also has an upstanding portion or wall 54 facing the front face of the glass panel. The inclined facing surfaces of the two elements 46 and 48 have co-operating trasverse projections or ridges with a saw-tooth profile.

Movement of the upper element 46 in a direction perpendicular to the glass panel 42 is prevented by the projection 52 engaging in the recess 50. The upstanding wall 54 of the upper element 46 prevents the glass panel 42 from being removed from the frame, and the clearance is taken up by moving the upper wedge-shaped packing element 46 up and along the lower element 48, the saw-tooth formations preventing the upper element from moving down.

Figures 5 and 6 show two different pairs of co-operating wedge-shaped packing elements, 56 and 58, and 60 and 62 respectively illustrating different arrangements of projections and recesses.

Figure 7 and 8 show two further co-operating wedge-shaped packing elements 64 and 66. They differ from those shown in Figure 3 and 4 in that, instead of the co-operating saw-tooth ridges, they have a pawl and rack formation. The inclined face of the lower or first element 64 has two flats 68 between which there is a toothed rack 70. The inclined face of the upper or second element 66 has two sprung pawls 72 extending parallel to the glass panel when assembled. The teeth of the rack 70 and the heads of the sprung pawls 72 are shaped such that movement of the upper element 66 up and along the inclined face of the lower element 64 is possible, with the pawls moving into recesses 74 in the upper element as they ride up the teeth, whereas movement down in the other direction is prevented.

Figures 9 and 9A show a glazing panel assembly which comprises a frame 122, a glass panel 124, with a front face to the left and a back face to the right of the drawing, and two co-operating wedge-shaped packing elements 126 and 128 between the frame and the panel. The first packing element 128 is one of two identical elements joined together by a web 130 having a weakened region 132 allowing the elements to be bent relative to each other and arranged perpendicular to each other in a corner of the frame.

The frame 122 has pairs of parallel longitudinal grooves 134 at each corner of which only one pair is shown. The underside of each packing element 128 has two longitudinal projections 136 which are received in the grooves 134 so preventing transverse movement of the packing element with respect to the frame 122.

The lower and first packing element 128 has two longitudinally extending upstanding projections 138 on its upper surface which are spaced inwardly from the edges leaving two flats. The upper and second packing element 126 has two longitudinally extending depending projections 140 which lie outside of the projections 138 and sit on the flats of the lower element 128.

The upper and second element 126 also has two longitudinally extending and upstanding portions 142 facing the glass panel and forming a channel in which the glass panel 124 is received.

The co-operating inclined faces of the two packing elements 126 and 128 have a pawl and rack formation. The lower and first element 128 has three aligned and off-centre sprung pawls 144 which are positioned between the longitudinal projections 138 and have recesses into which the pawls can move. The upper element 126 has a toothed rack 146 formed on its under side which lies between and is spaced from the longitudinal projections 140, the teeth being clearly seen in the scrap view of Figure 9A. The head of each pawl 144 has a perpendicular face 148 and an inclined face 150 and, similarly, each tooth of the rack 146 has a perpendicular face 152 and an inclined face 154. As the upper element 126 is moved up and along the lower element 128, the inclined face 154 of one of the teeth of the rack 146 will engage the inclined face 150 of the head of one of the pawls 144, forcing the pawl into its recess. When the crest of the tooth has passed the pawl 144, the pawl snaps back so that the respective perpendicular faces 148 and 152 of the pawl and tooth face each other and prevent downward movement of the upper element 126.

The positioning of the projections 138 of the lower first packing element 128 between the respective channels formed between the projections 140 and the rack 146 of the upper second element 126 prevents transverse movement of the two elements with respect to each other due to the oppos-

ing longitudinal surfaces.

In a modification of the assembly of Figure 9, the upstanding portion 142 of the upper element 126 that would be on the inside may be dispensed with provided that there is some other abutment for the glass panel 124.

The arrangement shown in Figures 9 and 9A is a glazing panel assembly in the form in which it is assembled on site. For transport from the factory to the site the packing element 126 will be of a different shape and configuration and will not encompass the pronounced toothed racks 146 which cooperate with projections 138 of packing element 128 in order to prevent transverse movement of the two elements. However, light serrations may be used to temporarily lock the packing elements together.

Figures 10, 10A and 10B show a glazing panel assembly which comprises a frame 156, a glass panel 158 which has a front face to the right and a back face to the left of the drawing and two co-operating wedge-shaped packing elements 160 and 162 between the frame and the panel. The packing element 162 is one of two identical elements joined together by a web 164 having a weakened region 166 allowing the elements to be bent relative to each other and arranged perpendicular to each other in a corner of the frame.

The frame 156 has two blind bores 168 and the lower and first packing element 162 has two studs 170 on its underside for engagement in the bores.

The lower packing element 162 has one longitudinally extending upstanding projection 172 on its upper surface which is spaced inwardly a short distance from the right hand or front edge to leave a flat 174. The upper and second packing element 160 has three longitudinally extending depending projections 176, 178 and 180 which sit on the upper surface of the packing element. The projection 180 sits on the flat 174, the width of the projection being less than that of the flat.

The upper element 160 also has a longitudinally extending upstanding portion 182 which faces the front face of the glass panel 158 when the panel is seated on the upper surface of the upper element.

The co-operating inclined faces of the two packing elements 160 and 162 have a pawl and rack formation. The lower element 162 has three sprung and aligned pawls 184 which are offset to the left hand or back edge of the element and recesses into which the pawls can move. The upper element 160 has a toothed rack 186 formed on its underside, the teeth being clearly seen in the enlarged scrap view of Figure 10A. The basic construction and operation of the pawl and rack formation is the same as that shown in Figures 9 and 9A with the difference that the width of the rack in Figure 10 is narrower.

When the glazing panel assembly is put together, the depending projection 176 of the upper packing element 160 is spaced from the left hand edge of the lower packing element 162 and sits close to the pawls 184; the depending projection 178 sits to the left of and is adjacent to the upstanding projection 172 of the lower packing element and the depending projection 180 sits on the flat 174 flush with the right hand edge of the lower packing element and spaced from the upstanding portion 172.

In this position, the pawls 182 and toothed rack 184 engage each other. Other elements of the assembly such as beading (not shown) on the left hand side engaging the frame 156 and the glass panel 158 hold the upper packing element 160 in position on the lower packing element 162 and the glass panel 158 in position on the upper packing element.

Movement of the upper packing element 160, with the glass panel 158, to the right in the direction of arrow 188 and with respect to the lower packing element 162 is prevented by contact by the depending projection 178 with the upstanding projection 172. Also the glass panel 158 cannot be moved in the direction of arrow 188 with respect to the upper packing element 160 because of the upstanding projection 182.

By removing the beading, the upper packing element 160, together with the glass panel 158, can be moved in the direction of arrow 190 perpendicular to the glass panel, whereupon the pawls 184 and toothed rack 186 disengage from each other. This allows the upper packing element 160 to be then slid down the lower packing element 162 and the glass panel 158 to be removed from the assembly. In a commercial or domestic glazing panel assembly, the direction of arrow 190 would be to the interior of the building, so that a burglar of thief could not gain access to the beading on the inside in order to remove the glass panel front the outside.

In a variation, the pawl and rack formation can be replaced by sets of teeth such as is shown in Figure 2 for example.

Figures 11 and 11A show two co-operating wedge-shaped packing elements for use in a glazing panel assembly and Figure 12 shows the assembly. The elements comprise a first packing element 192 which is one of a joined pair similar to that shown, for example, in Figure 10, and a second packing element 194 which has been turned round for reasons of clarity. The packing elements 192 and 194 have co-operating inclined surfaces, the inclined surface of the first packing element 192 having two longitudinally extending upstanding projections 196 and 198 which are spaced from the

longitudinal edges of the packing element and from each other. Each projection 196, 198 has teeth 200, 202 along the left hand side. The inclined surface itself has two sets of transversely extending teeth with a saw-tooth profile, one set 204 extending from the projection 196 to the left hand side of the packing element 192 and the other set 206 extending from the projection 198 to the right hand side of the packing element. The teeth 200, 202 are deeper than the teeth 204, 206 but have the same spacing and are aligned with them. The first packing element 192 also has a longitudinal portion 208 upstanding from the left hand edge with a projection 210 extending from its upper edge and to the left. The free left hand edge of the projection 210 has two adjoining levelled edges 212 and is undercut at 214.

The second packing element 194 has two longitudinal depending projections 216 and 218 which are adjacent to the left and right hand edges respectively. The surfaces of these projections 216 and 218 facing the first packing element 192 have transversely extending teeth 220 and 222 with a saw-tooth profile and depth corresponding to the teeth 204 and 206 on the inclined surface of the first packing element 192.

Between the two projections 216 and 218, spaced from them and from each other are two further longitudinal depending projections 224 and 226. Each projection 224, 226 has teeth 228, 230 along the right hand side corresponding in shape and size to the teeth 200 and 202 on the projections 196 and 198 of the first packing element 192. The teeth 228 and 230 have the same spacing and are aligned with the teeth 204 and 206 as with the first packing element 192.

The second packing element 194 also has an upstanding projection 232 extending along and adjacent to the right hand edge.

Figure 12 shows a frame 234, a double glazed panel unit 236 having a back face to the left and a front face to the right of the drawing, packing elements 192 and 194 which are disposed between the frame and the panel, and longitudinal beading. The frame 234 provides a flat seat 238 for the first packing element 192 and has an upstanding projection 240, the projection 210 of the first packing element 192 engaging over this projection. The panel 236 sits on the second packing element 194, with the upstanding portion 232 facing the front face of the panel. The beading includes a rubber beading 242 connected to the frame 234 and engaging the back face of the panel 236, a plastics beading 244 connected to the other side of the frame, and a rubber beading 246 connected to the plastics beading 244 and engaging the front face of the panel. During the assembly process, the first packing element 192 is fitted in position, the bevelled edges 212 of the projection 210 facilitating the insertion of the projection between the projection 240 of the frame and the portion supporting the beading 242. Then the second packing element 194 is placed on the first packing element 192 in the position shown in Figure 11A, with the teeth 200 and 202 of the first packing element not in engagement with the teeth 228 and 230 of the second packing element. However, the teeth 204 and 206 of the first packing element 192 are in engagement with the teeth 220 and 222 of the second packing element 194. The panel 236 is then lifted, from the right hand side, over the upstanding projection 232 and onto the second packing element 194.

The second packing element 194, with the glass panel 236, is then moved up the first packing element 192 with the teeth 204, 206 and 220, 222 holding the second packing element in place in case minor adjustments are required. When the clearance has been taken up, the second packing element 194 is then moved transversely to the right with respect to the first packing element 192 so that the teeth 200, 202 and 228 and 230 engage one another. Since these latter teeth are much deeper, further movement up or down the first packing element 192 is prevented. The rubber beading 242 is then fixed in place preventing the second packing element 194 from moving transversely and thus longitudinally. The beading 224 and 246 is then fixed in place.

If one assumes that the assembly of Figure 12 is, for example, for a house, then the interior of the house is on the left hand side. A person trying to enter the house from the outside (right hand side) by removing the glass panel 236 would not be able to do so even if they removed the exterior beading 244 and 246. This is because the glass panel 236 would have to be lifted over the upstanding portion 232 of the second packing element 194, and this is not possible because all clearances have been taken up by the packing elements 192 and 194.

However, if for some reason the owner of the premises or a person having a legitimate reason and access to the interior of the house wishes to have the glazing panel assembly disassembled, then the interior beading 242 is removed, the second packing element 194, with the glass panel 236, is moved transversely to the left with respect to the first packing element 192 so causing the teeth 200, 202 and 228, 230 to become disengaged. The second packing element 194 is then moved down the first packing element 192 with only a little difficulty since the teeth 204, 206 and 220,222 are not deep.

Figure 13 shows a part view of a first packing element 248 similar to that shown in Figures 11, 11A and 12, in which the upstanding portion 250

and the projection 252 for engaging the frame has been modified by being divided into three longitudinally spaced portions. The middle portion 254 is of the same shape as that of Figure 11, whereas the two end portions 256 have a single upward bevelled edge 258 for engaging in a correspondingly shaped part of the frame.

Figures 14 and 14a illustrate a further two co-operating wedge-shaped packing elements which are engaged together in a different manner. The upper packing element 260 has hemisphersical recesses 264 formed along its length. Lower packing element 262 has a similar single recess 266 formed therein. In use, the packing elements 260 and 264 are tightened together by the use of finger pressure and when they are tight a dowel 270, moulded with a handle 272, is pushed into the hole formed by the co-operation of one of the hemispherical recesses 264 and the single hemispherical recess on the lower packing element 262. The upper packing element 260 is provided with an upstanding wall 268 which is designed to prevent a glass panel positioned thereagainst being removed from the frame, and with a projection 274 which co-operates with a recess formed in lower packing element 262 to prevent the packing element 260 and 262 from being moved transversely with respect to one another.

Figures 15 and 15a illustrate another alternative manner in which two wedge-shaped packing elements may co-operate. Upper packing element 276 has a rack 280 formed in a recess along the outer edge thereof. Lower packing element 278 has a pawl 282 which is formed along the outer edge thereof. In use, the two wedges are tightened together and pawl 282 locks into an appropriate indent in rack 280. The pawl 282 is also provided with a handle 284 so that to remove the pawl from the rack the pawl is pressed down using the handle 284 and the wedges unlock.

Figure 16 illustrates a double glazed unit in which two panels of glass 290 are spaced apart by a spacer 292 set back from the ends of the glass panels 290. The resultant cavity is filled with mastic and while the mastic is still plastic an upper packing element 294 is pressed into the mastic bed. When the mastic sets the upper packing element 294 is secured to glass panels 290. The upper packing element 294 has a longitudinal channel 296 formed therein. Lower packing element 298 is provided with a longitudinal rib 300 which is adapted to co-operate with the longitudinal channel 296 formed in upper packing element 294. The upper packing element is also provided with upstanding walls 293 which bear against the outer faces of glass panels 290. Upper and lower packing elements 294 and 298 are of wedge-shaped configuration as is best seen from Figure 16a. As shown in Figure 16a the upper packing element 296 may be a right angle moulding and it then acts as a permanent corner protector for the glass 290. As shown in Figure 16a there are two packing elements 298 which secure the upper packing element 294 in position at the corner of the frame.

Claims

1. A panel assembly comprising a panel (42) having a front face and a back face, a frame (36) surrounding the panel, first (48) and second (46) longitudinal packing elements which are disposed between the frame and the panel and longitudinal sealing means engaging the frame and the panel, the first (48) and second (46) packing elements being wedge-shaped and including engaging means which prevent the elements from moving down each other, characterized in that the first packing element (48) is held against transverse movement with respect to the frame (36), the second packing element (46) has an upstanding portion (54) which faces the front face of the panel and is held against movement in a first direction, which first direction extends from the panel towards the upstanding portion of the second packing element, by engagement of a surface of the first packing element (48) with a surface of the second packing element (46), and in that the assembly includes means preventing movement of the second packing element (46) in a second direction which is opposite to the first direction.

2. A panel assembly as claimed in claim 1, wherein the engaging means is provided on the inclined opposed surfaces of the first (48) and second (46) packing elements.

3.A panel assembly as claimed in claim 1 or claim 2 wherein the engaging means comprises a pawl (72) and rack (70) formation.

4. A panel assembly as claimed in claim 1 or claim 2 wherein the engaging means comprises teeth.

5. A panel assembly as claimed in any one of the preceding claims wherein the means (242) preventing movement of the second element in the second direction is removable.

6. A panel assembly as claimed in claim 5, wherein the means (242) comprises a sealing means engaging the back face of the panel.

7. A panel assembly as claimed in claim 5 or 6 wherein, when the said means (242) is removed, the second packing element (194) is movable with respect to the first packing element (192) in the second direction by a pre-determined distance to a position at which the engaging means is disengaged.

8. A panel assembly as claimed in any one of claims 1 to 4, wherein the means preventing move-

ment of the second packing element in the second direction comprises a surface fixed with respect to the first packing element or frame which faces in the first direction and a surface fixed with respect to the second packing element which faces in the second direction, the two surfaces facing each other.

9. A panel assembly as claimed in claim 8, wherein one of the packing elements co-operates with a wedge-shaped third element.

10. A panel assembly as claimed in any one of the preceding claims, wherein the frame (122) and the first packing element (128) have interengaging formations (134, 136) holding the first packing element (128) against transverse movement with respect to the frame (122).

11. A panel assembly as claimed in claim 10, wherein the formations comprise a channel (134) in the frame (122) receiving the first packing element (128).

12. A panel assembly as claimed in claim 10, wherein the formations comprise a longitudinal groove (134) in the frame (122) receiving a longitudinal projection (136) of the first packing element (128).

13. A panel assembly as claimed in claim 10, wherein the formations comprise a bore (168) in the frame (156) receiving a stud (170) of the first packing element (162).

14. A panel assembly as claimed in claim 10, wherein the first element (192) has a projection (210) which extends in the second direction and which is undercut and engages over an upstanding projection (240) of the frame (234).

European Patent Office

EUROPEAN SEARCH REPORT

Application Number

EP 90 30 7862

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int. Cl.5)
X,Y,A	DE-A-3 236 226 (SCHMITZ) * page 9, line 1 - page 14, line 33; figures 1-9 *	1,2,4,8,9, 10,11,12, 13,14,6	E 06 B 3/54
Y	DE-U-8 811 065 (NIEMANN) * page 7, paragraph 2; figure 1 *	12	
Y,A	GB-A-1 147 673 (SCHÜRMANN) * page 2, lines 69 - 98; figures 9, 11 *	13,1,2,4, 10	
Y,A	GB-A-2 212 545 (CEGO) * page 9, paragraph 3 - page 13, paragraph 2 * * page 15, paragraph 4 - page 22, paragraph 1; figures 1-7 *	14,5,6	
A	US-A-3 836 118 (MEYER) * column 2, line 23 - column 3, line 65; figures 1-8 *	1,2,4,8	
A	GB-A-2 067 641 (HEWITT) * page 2, line 71 - page 3, line 108; figures 1-8 *	1,2,4,9, 10,13	
A	DE-A-2 940 075 (KÖNIG) * page 10, line 1 - page 13, line 5; figure *	1,10,13, 14	TECHNICAL FIELDS SEARCHED (Int. Cl.5) E 06 B

The present search report has been drawn up for all claims

Place of search	Date of completion of search	Examiner
The Hague	09 November 90	DEPOORTER F.

CATEGORY OF CITED DOCUMENTS

X: particularly relevant if taken alone
Y: particularly relevant if combined with another document of the same category
A: technological background
O: non-written disclosure
P: intermediate document
T: theory or principle underlying the invention

E: earlier patent document, but published on, or after the filing date
D: document cited in the application
L: document cited for other reasons

&: member of the same patent family, corresponding document